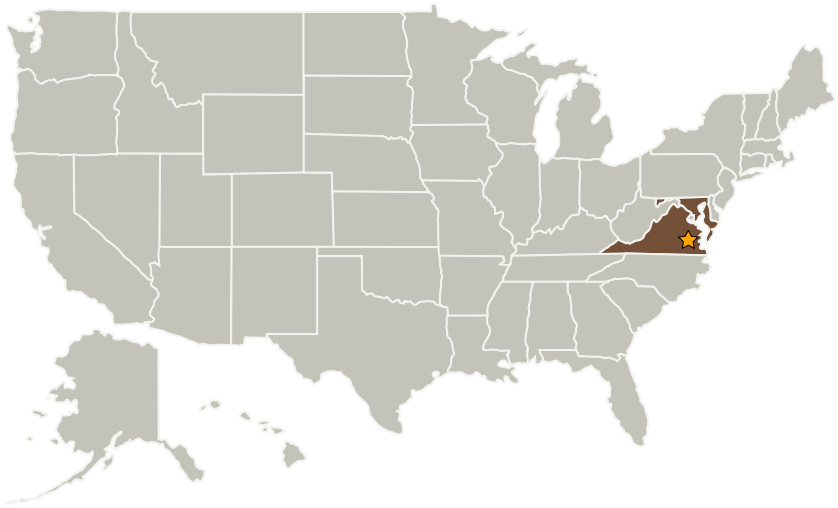
Multifunctional SWNT-Based Structural Composites, Phase I

Completed Technology Project (2004 - 2004)

Project Introduction

GMA Industries, Inc. proposes produce a lightweight, fully polymeric but intrinsically conducting hybrid material that can be applied towards the production of next-generation sealants, structures and components. This will be achieved through the production of a single wall nanotube (SWNT)-containing matrix material, using wet chemistry processes and methods. An ability to incorporate the significant electronic, mechanical, thermal properties, scattering- and optical-limiting properties of carbon nanotubes into a homogeneously dispersed covalently-bound structural matrix will provide a platform for the creation of a new class of composite matrices that addresses NASA's desire for multifunctional composite materials that harness superior thermal, mechanical, and optoelectronic efficiencies. Furthermore, it is anticipated that a capability for real-time, in-situ monitoring of the structure's health can be incorporated within the architecture of these composites?whose susceptibility towards an assortment of phenomena (mechanical, chemical, optical, electrical, magnetic, etc.) can be further manipulated?through synthetic modifications of the SWNT component of the matrix. No such carbon-nanotube derived material is currently available. In Phase 1, the feasibility of producing such a composite will be demonstrated. Phase II will involve the further process optimization, development, and full characterization of this material.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Langley Research Center (LaRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Langley Research Center(LaRC)	Lead Organization	NASA Center	Hampton, Virginia
GMA Industries Inc	Supporting Organization	Industry	Annapolis, Maryland

Primary U.S. Work Locations	
Maryland	Virginia

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

David Adebimpe

Technology Areas

Primary:

- TX14 Thermal Management Systems
  - TX14.3 Thermal Protection Components and Systems
    - TX14.3.1 Thermal Protection Materials